METHOD AND DEVICE TO IMPROVE THE RATIO OF OXYGEN MASS VERSUS FUEL MASS DURING IGNITION IN COMBUSTION MECHANISMS OPERATING WITH FLUID HYDROCARBON FUELS

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FIELD OF THE INVENTION

The present invention relates to the improvement in combustion efficiency of conventional fluid hydrocarbon fuels, such as natural gas or propane gas and the like when employed as fuel for residential, commercial and industrial space heating or cooling equipment, or for process heating, smelting or generating equipment and turbines, whereby such combustion efficiency improvement is obtained through a change in the mass ratio of fuel versus combustion air such as to effectively increase the available oxygen mass relative to fuel mass during ignition.

BACKGROUND OF THE INVENTION

It is generally recognized that the combustion process of conventional fluid hydrocarbon fuels is improved if additional oxygen is introduced into the combustion air / fuel gas mixture at the time of ignition. It is further recognized that the manipulated infusion of additional oxygen into the combustion air / fuel gas mixture is only possible in connection with additional energy expenditure to perform such task.

The Power Generation Industry is now starting to provide a way of getting more energy from a gas turbine power plant by cooling down the combustion air. Cooling the gas turbine combustion air makes it denser, increasing the mass flow of oxygen for combustion relative to the fuel mass flow. Employing special evaporative air coolers which are attractive to gas turbine operator. Improvements for gas turbines output are substantial. The Industry quotes that, "at an ambient temperature of 100o F (38oC) and 30% relative humidity, it is possible to achieve a power increase of 11% to 24% just by cooling the combustion intake air", without indicating any specific temperature level